

NASA's Launch Services Program presents...

National Aeronautics and
Space Administration



InSight

***Launch Vehicle
Atlas V-401***

***Launch Location
Vandenberg
Air Force Base, CA***

***Launch Date
March 2016***



InSight (Interior exploration using Seismic Investigations, Geodesy and Heat Transport) is a NASA Discovery Program mission that will place a single geophysical lander on Mars to study its deep interior.

But InSight is more than a Mars mission - it is a terrestrial planet explorer that will address one of the most fundamental issues of planetary and solar system science - understanding the processes that shaped the rocky planets of the inner solar system (including Earth) more than four billion years ago.

By using sophisticated geophysical instruments, InSight will delve deep beneath the surface of Mars, detecting the fingerprints of the processes of terrestrial planet formation, as well as measuring the planet's "vital signs": Its "pulse" (seismology), "temperature" (heat flow probe), and "reflexes" (precision tracking).

InSight seeks to answer one of science's most fundamental questions: How did the terrestrial planets form?

The InSight mission will conduct six science investigations on and below the surface of Mars to uncover the evolutionary history that shaped all of the rocky planets in the inner solar system. It will:

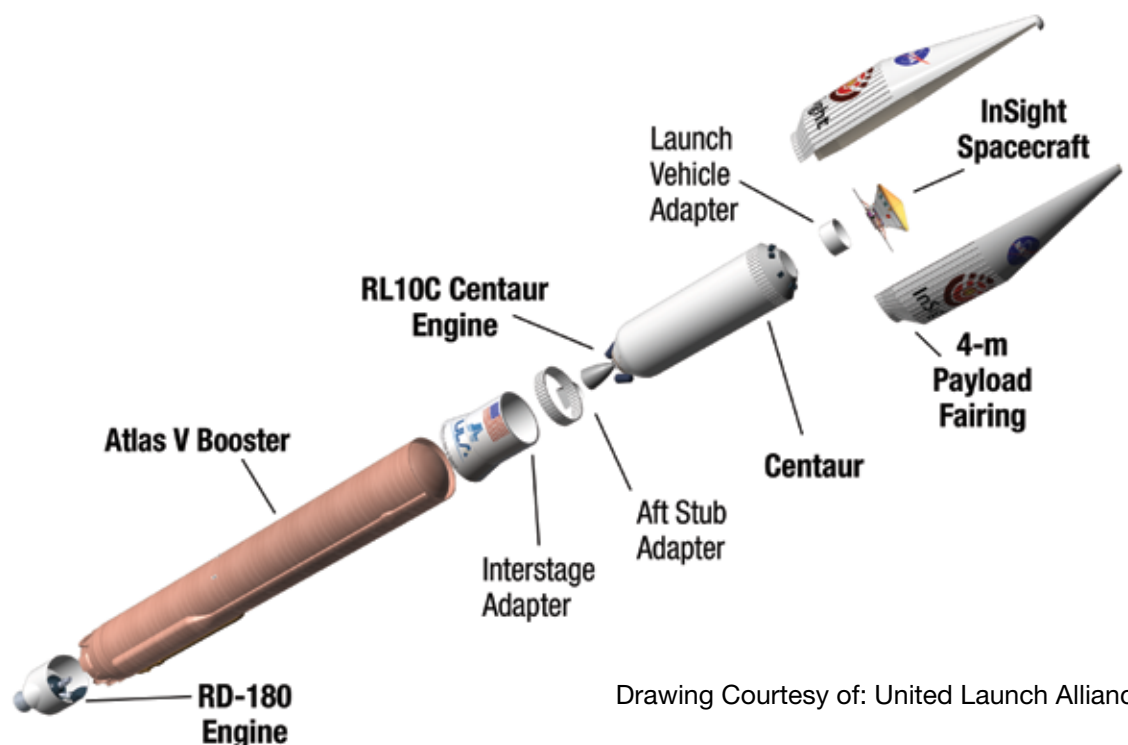
- Determine the size, composition, physical state (liquid/solid) of the Martian core
- Determine the thickness and structure of the Martian crust
- Determine the composition and structure of the Martian mantle
- Determine the thermal state of Mars' interior
- Measure the magnitude, rate and geographical distribution of Mars' internal seismic activity
- Measure the rate of meteorite impacts on the surface of Mars

InSight (Interior exploration using Seismic Investigations)

The InSight mission is similar in design to the Mars lander that the Phoenix mission used successfully in 2007 to study ground ice near the north pole of Mars. The reuse of this technology, developed and built by Lockheed-Martin Space Systems in Denver, CO, will provide a low-risk path to Mars without the added cost of designing and testing a new system from scratch.

The InSight lander will be equipped with two science instruments that will conduct the first “check-up” of Mars in more than 4.5 billion years, measuring its “pulse”, or internal activity; its temperature; and its “reflexes” (the way the planet wobbles when it is pulled by the Sun and its moons). Scientists will be able to interpret this data to understand the planet’s history, its interior structure and activity, and the forces that shaped rocky planet formation in the inner solar system.

The science payload is comprised of two instruments: the Seismic Experiment for Interior Structure (SEIS), provided by the French Space Agency (CNES), with the participation of the Institut de Physique du Globe de Paris (IPGP), the Swiss Federal Institute of Technology (ETH), the Max Planck Institute for Solar System Research (MPS), Imperial College and the Jet Propulsion Laboratory (JPL); and the Heat Flow and Physical Properties Package (HP³), provided by the German Space Agency (DLR), with the participation by the Polish Space Agency (CBK). In addition, the Rotation and Interior Structure Experiment (RISE), led by JPL, will use the spacecraft communication system to provide precise measurements of planetary rotation.



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